

What is claimed is:

- 5 1. A method of producing a perovskite complex oxide containing a noble metal element comprising a step of heat-treating a precursor substance containing at least one rare earth element and at least one transition metal element to generate a perovskite complex oxide phase, characterized in that an amorphous substance is used as the precursor substance and the noble metal element is incorporated in the amorphous substance.
- 10 2. A method of producing a perovskite complex oxide containing a noble metal element comprising a step of heat-treating a precursor substance containing at least one rare earth element and at least one transition metal element to generate a perovskite complex oxide phase, characterized in that an amorphous substance is used as the precursor substance, the amorphous  
15 substance in powdery state is slurried in a solvent containing ions of the noble metal element, the slurry is dried to impregnate the noble metal element into the amorphous substance, and the solid after drying is subjected to said heat treatment.
- 20 3. A method of production according to claim 2, wherein when the amorphous substance is slurried in the solvent containing the noble metal element ions, the slurry is adjusted to a pH of 6 or higher in co-presenting nitrate ions and ammonium ions therein.
- 25 4. A method of production according to claim 3, wherein the mole ratio of the total amount of nitrate ions and ammonium ions to the total amount of rare earth element and transition metal element in the amorphous substance is greater than 0.6.
- 30 5. A method of production according to any of claims 1 to 4, wherein the heat-treatment temperature is in the range of 400 – 700 °C.

6. A method of production according to any of claims 1 to 5,  
wherein the amorphous substance is a precipitation product produced by reacting an  
aqueous solution of a mineral acid salt of the rare earth element and a mineral acid  
salt of the transition metal element with a precipitant at a reaction temperature of  
5 60 °C or lower and a pH of 6 or higher.

7. A noble metal element-containing perovskite complex oxide  
including at least one rare earth element and at least one transition metal element,  
10 which contains the noble metal element in its crystal and has a BET specific surface  
area of greater than 10 m<sup>2</sup>/g.

8. A perovskite complex oxide according to claim 7, wherein at least  
80% of the noble metal element contained therein is dissolved in its crystal lattice in  
15 solid solution.